



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D205-596-105
Job Sheet 179886



Part No: D205-596-105

Job Qty: 1 ea

Part Name: Fwd Crosstube - Extended Height 31"



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 6/25/18

Job Tracking No:

Due Date: 7/31/18

Created By: Jesse White

Type: Stock

Description:

Note: D205-596-105 REV.C IPP Rev:D 05.03.21 Added bending procedure KJ/JLM IPP Rev:E 08-01-10 ECN 1075 DD IPP Rev F 08.04.28 Added bending & mat'l EC verified by: DD IPP rev G 10.05.27 chg QC15 to QC6 EC verified by: DD IPP REV:H 13.11.29 as per dwg DEO B-2 DD VERF:JLM IPP REV:I 18.02.08 AS PER DWG REV.C DD VERF:JFS

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea		7/31/18	0.00	0.00	Start Up Crosstubes-1		GP 2018-09-04
105	HandFXtube	1 pcs		7/31/18	0.00	0.51	HandFinish5		GP 2018-09-04
107	QC	1 pcs		7/31/18	0.00	0.00	QC7-1		
110	CNC Bend Crosstubes	1 pcs		7/31/18	2.55	0.00	CNC Bend Crosstube		GP 2018-09-04
130	QC	1 pcs		7/31/18	0.00	0.00	QC15		
140	Crosstubes	1 pcs		7/31/18	0.00	1.37	Crosstubes-1		
150	HandFXtube	1 pcs		7/31/18	0.00	0.51	Crosstubes-3		
155	QC	1 pcs		7/31/18	0.00	0.00	QC7-1		
160	QC	1 pcs		7/31/18	0.00	0.00	QC5		
170	SprayPaint	1 pcs		7/31/18	0.00	2.03	Spray Paint		
180	QC	1 pcs		7/31/18	0.00	0.00	QC14		
190	Crosstubes	1 pcs		7/31/18	0.00	1.37	Crosstubes-1		
200	QC	1 pcs		7/31/18	0.00	0.00	QC5		
205	DC	1 pcs		7/31/18	0.00	0.00	DC		
210	Packaging	1 pcs		7/31/18	0.00	0.00	Packaging3-1		
220	QC21-FG	1 Ea		7/31/18	0.00	0.00	QC21		

Part Op 105 - INSIDE AND OUT

Descriptions: 110 - Bend as per Dwg D2889 using CNC bender program

140 - 1-Cut as per Dwg D205-596-105 2-*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Deburr & Inspect for surface damage. Polish cut surface. Scribe part # and batch # on one end of tube.

150 - ***IMMEDIATELY AFTER GRINDING***

170 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** 1-Prime inside and outside as per dwg and per QSI 005 4.1 Batch: _____ 2- Paint outside per QSI 005 4.2 Batch: _____

190 - 1- Lightly scuff the bonded area using a 180 grit sand paper and clean the area with 41058 wash 'n' wipe 2- Apply Proseal as per dwg D205-596-105. 3- Install clamps as per dwg (Note 12) Torque clamps 80 to 100 in-lb as per dwg and Note 13)

200 - ***PRIOR TO PACKAGING RECHECK TORQUE ON CLAMPS AFTER PROSEAL HAS CURED 72HOURS.***

205 - Photocopy D205-594 bluefile & type labels per PPP D205-596-105 CHG003

210 - Identify and pack for shipping as per PPP D205-596-105

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: <u>179886</u> Part No. <u>D205-596-105</u> NCR No. _____		DISPOSITION Rework ☐ Scrap ☒ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%;"> <tr> <td>Skid-tube ☐</td> <td>Cross tube ☒</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>				Skid-tube ☐	Cross tube ☒	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐																																																			
Skid-tube ☐	Cross tube ☒	Water Jet ☐	Engineering ☐																																																																						
Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐																																																																						
Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐																																																																						
Large Fab ☐	Composite ☐	Supplier ☐																																																																							
Date : <u>18-09-06</u>		Step #: <u>110</u>		QTY Effective : <u>①</u>		MRB (QSI042) Approval DAS 9 9-89 <u>18-09-06</u>																																																																			
Description Work Order Deviation <u>Programme was started at wrong tangents line. tube overbent</u>				Disposition <u>Scrap destroy</u>		Completed By <u>GP</u>																																																																			
						Lead hand / Supervisor Approval Verification DAS 9 9-89 <u>18-09-06</u>																																																																			
						QC / QA Coordinator Approval DAS 9 9-89 <u>18-09-06</u>																																																																			
Root Cause <table style="width:100%;"> <tr> <td>Environment ☐</td> <td>No Re-verification ☐</td> <td>Pressure/Forced ☐</td> </tr> <tr> <td>Design ☒</td> <td>Operator ☐</td> <td>Bending ☐</td> </tr> <tr> <td>Doc/Data ☐</td> <td>Offset/Setup ☐</td> <td>Centre Not Concentric ☐</td> </tr> <tr> <td>Equip/Tooling ☐</td> <td>Supplier ☐</td> <td>Cracks ☐</td> </tr> <tr> <td>Handling/Pre ☐</td> <td>Training ☐</td> <td>Crimp/Kink/Ripple/Wave ☐</td> </tr> <tr> <td>Material ☐</td> <td>Use for Testing ☐</td> <td>Cuffs ☐</td> </tr> <tr> <td>Internal Transport ☐</td> <td>Poor Information ☐</td> <td>Crushing ☐</td> </tr> <tr> <td>Tribal Knowledge ☐</td> <td>Rushing ☐</td> <td>Heat Treat ☐</td> </tr> <tr> <td>LOA ☐</td> <td>Product Improvement ☐</td> <td>Wave/Twist in Tube ☐</td> </tr> <tr> <td>Substation ☐</td> <td>Process Improvement ☐</td> <td>Marks/Chatter ☐</td> </tr> <tr> <td>Past Expiry Date ☐</td> <td>Manufacturing Process ☐</td> <td></td> </tr> <tr> <td>Misidentified ☐</td> <td>Past Due ☐</td> <td>OTHER : _____</td> </tr> </table>				Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Design ☒	Operator ☐	Bending ☐	Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	Equip/Tooling ☐	Supplier ☐	Cracks ☐	Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Material ☐	Use for Testing ☐	Cuffs ☐	Internal Transport ☐	Poor Information ☐	Crushing ☐	Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Past Expiry Date ☐	Manufacturing Process ☐		Misidentified ☐	Past Due ☐	OTHER : _____	FAULT CATEGORY <table style="width:100%;"> <tr> <td>Temperature/Cure ☐</td> <td>Power Loss/Surge ☒</td> <td>Positioned Wrong ☒</td> </tr> <tr> <td>Set-up ☐</td> <td>Folio/Program ☐</td> <td>Outside Dimensions ☐</td> </tr> <tr> <td>BOM/Route ☐</td> <td>Grain ☐</td> <td>Over/Under tolerance ☐</td> </tr> <tr> <td>Broken/Damage/Defect ☐</td> <td>Weld ☐</td> <td>Part Incorrect ☐</td> </tr> <tr> <td>Inspection Incomplete/Unqualified ☐</td> <td>Wrong Stock Pulled ☐</td> <td>Part Lost/Missing ☐</td> </tr> <tr> <td>Contamination ☐</td> <td>Out of Sequence ☐</td> <td>Part Moved ☐</td> </tr> <tr> <td>Countersink ☐</td> <td>Off-set ☐</td> <td>Drawing ☐</td> </tr> <tr> <td>Cut Too Short ☐</td> <td>Mislabeled ☐</td> <td>Finish ☐</td> </tr> <tr> <td>Instructions Incomplete/Unclear ☐</td> <td>Fit/Function ☐</td> <td>Misread ☐</td> </tr> <tr> <td>Drill Holes ☐</td> <td>Misaligned/off center ☐</td> <td>Turning Sequence ☐</td> </tr> </table>				Temperature/Cure ☐	Power Loss/Surge ☒	Positioned Wrong ☒	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐	Countersink ☐	Off-set ☐	Drawing ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐
Environment ☐	No Re-verification ☐	Pressure/Forced ☐																																																																							
Design ☒	Operator ☐	Bending ☐																																																																							
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐																																																																							
Equip/Tooling ☐	Supplier ☐	Cracks ☐																																																																							
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐																																																																							
Material ☐	Use for Testing ☐	Cuffs ☐																																																																							
Internal Transport ☐	Poor Information ☐	Crushing ☐																																																																							
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐																																																																							
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐																																																																							
Substation ☐	Process Improvement ☐	Marks/Chatter ☐																																																																							
Past Expiry Date ☐	Manufacturing Process ☐																																																																								
Misidentified ☐	Past Due ☐	OTHER : _____																																																																							
Temperature/Cure ☐	Power Loss/Surge ☒	Positioned Wrong ☒																																																																							
Set-up ☐	Folio/Program ☐	Outside Dimensions ☐																																																																							
BOM/Route ☐	Grain ☐	Over/Under tolerance ☐																																																																							
Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐																																																																							
Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐																																																																							
Contamination ☐	Out of Sequence ☐	Part Moved ☐																																																																							
Countersink ☐	Off-set ☐	Drawing ☐																																																																							
Cut Too Short ☐	Mislabeled ☐	Finish ☐																																																																							
Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐																																																																							
Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐																																																																							

Job BOM				
Part / Item	Component Name	Quantity	Operation	Container
D6005-180	Crosstube Material	1 Ea (1 ea)	90-Start up Operation	
D2893-1	Support	2 Ea (2 ea)	190-Crosstubes	
D3595-063-450	Rubber Cushion 0.63" Wide X 4.50" Long	4 Ea (4 ea)	190-Crosstubes	
MS21920-25	Clamp	4 Ea (4 ea)	190-Crosstubes	

Job Allocations				
Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	D6005-180	1	14	0
190-Crosstubes	D2893-1	2	13	0
	D3595-063-450	4	132	0
	MS21920-25	4	187	0

Part Specifications				
Specifications could not be found.				

Plex 6/25/18 1:29 PM dart.white.jesse



Container No: S108024



Part: D205-596-105

Job No: 179886

Serial No/Batch: S108024

Revision: C

Inspector:

Exp Date:

Instructions: TC STC SH03-6 Issue 4, FA STC SR01742N

Dart Aerospace Ltd.
 1270 Aberdeen Street
 Hawkesbury, ON K6A 1K7
 CANADA
 TEL.: 1 813 632-5200
 Email: sales@dartaero.com
 www.dartaerospace.com

PARTS LIST:

ITEM	QTY -105	QTY -105B	PART NUMBER	DESCRIPTION
	X		D205-596-105	CROSSTUBE ASSEMBLY, HI-HI FWD
		X	D205-596-105B	CROSSTUBE ASSEMBLY, HI-HI FWD, 214
1	1	1	D6005-180	CROSSTUBE
2	2		D2893-1	SUPPORT
3	4	4	D3595-063-450	RUBBER CUSHION
4		2	D5018-1	SUPPORT, 214 AFT
5	4	4	MS21920-25	CLAMP
6	A/R	A/R	PROSEAL 890 B-2	SEALANT (OR AMS-S-8802 CLASS B-2)

GENERAL NOTES:

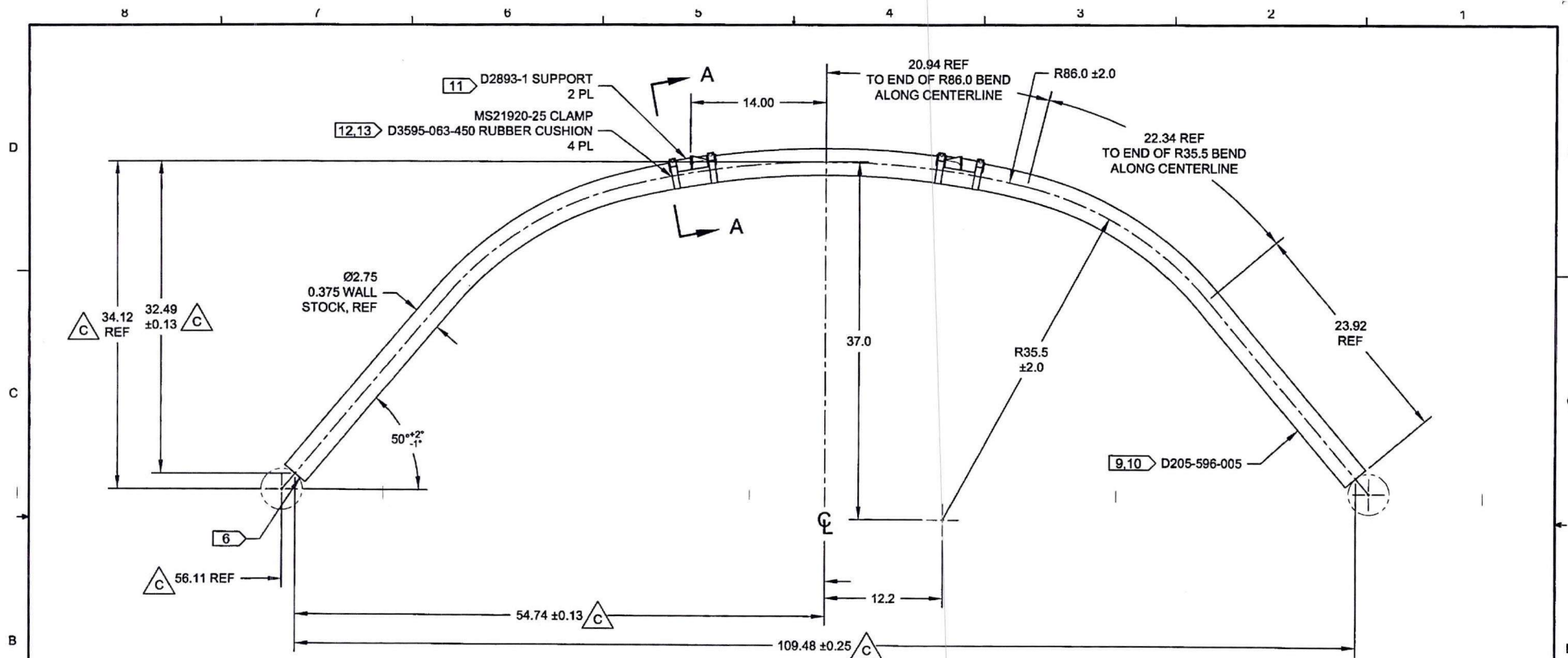
- 1) MATERIAL: MANUFACTURE FROM D6005-180
FINISHED LENGTH = 134.40 ± 0.02
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS
- 7) WEIGHT: 40 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE
- 9) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) TO INSTALL D2893-1 / D5017-1 SUPPORTS: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 12) INSTALL MS21920-25 CLAMPS WITH D3595-063-450 RUBBER CUSHIONS TO SECURE D2893-1 / D5017-1 SUPPORT. ENSURE CLAMP MECHANISMS ARE ON TOP SIDE OF CROSSTUBE.
NOTE: IT IS ACCEPTABLE TO SUBSTITUTE MS21920-25 CLAMPS WITH LONGER (MS21920-26) OR SHORTER (MS21920-24) CLAMPS TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

RELEASED

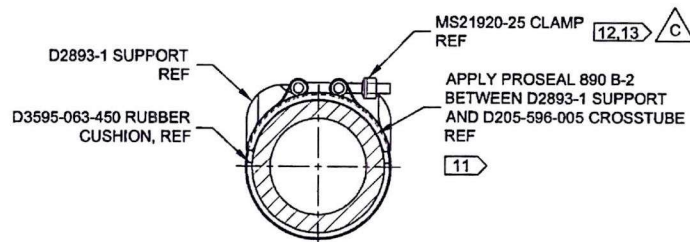
2018 JAN 24 4P
ECN 18-525

C	REFORMAT, ADD SHT 3, HEIGHT/WIDTH DIM & TOL CHG, ADD TOTAL WIDTH DIM (B4-2, B4-3, CLAMP ORIENTATION FLIPPED (A5-2, A5-3), INCORP ALL DEO'S	CP	17.08.23
B	SUPPORT NOW MAGNOBONDED; REMOVE D2856-600-851 ABRASION STRIP; UPDATED NOTES; ADDED D3595-063-450 CUSHION; MS21920-25 WAS MS21920-24	MB	07.12.03
A	NEW ISSUE	DS	02.11.20
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED	AS		
MFG. APPR.	WM		
APPROVED	WM		
DE APPR.			
DATE	17.08.23		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D205-596-105	REV. C SHEET 1 OF 3
TITLE CROSSTUBE ASSEMBLY, HI-HI FWD	SCALE NTS
COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



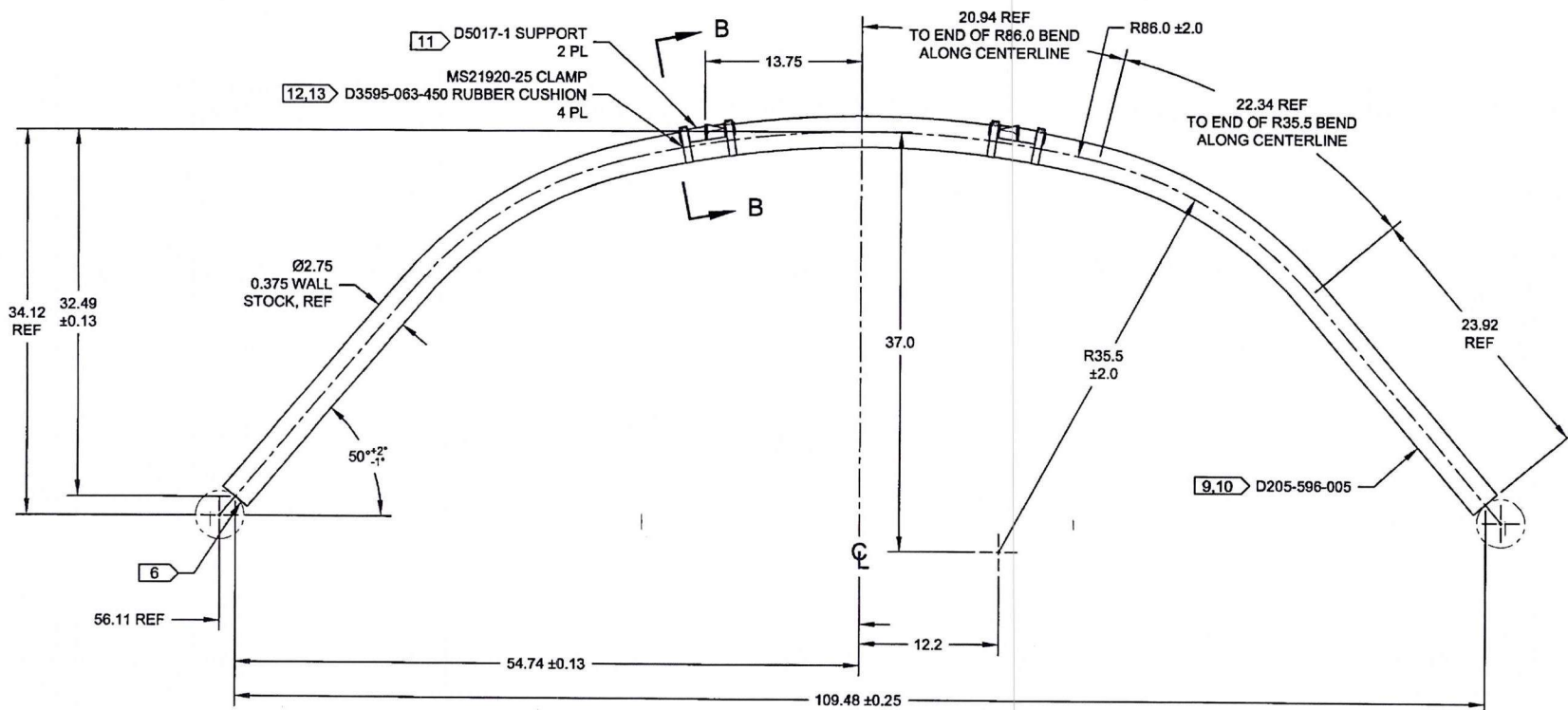
D205-596-105 CROSTUBE ASSEMBLY, HI-HI FWD



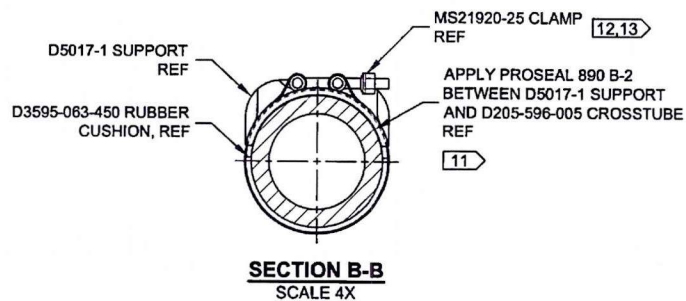
SECTION A-A
SCALE 4X

RELEASED
2010 JAN 24 47

DESIGN	<i>[Signature]</i>	DART AEROSPACE LTD	
DRAWN	<i>[Signature]</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>AJS</i>	DRAWING NO.	REV. C
MFG. APPR.	<i>[Signature]</i>	D205-596-105	SHEET 2 OF 3
APPROVED	<i>WM [Signature]</i>	TITLE	SCALE
DE APPR.	<i>[Signature]</i>	CROSTUBE ASSEMBLY, HI-HI FWD	NTS
DATE	17.08.23	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD	



D205-596-105B CROSSTUBE ASSEMBLY, HI-HI FWD, 214 C

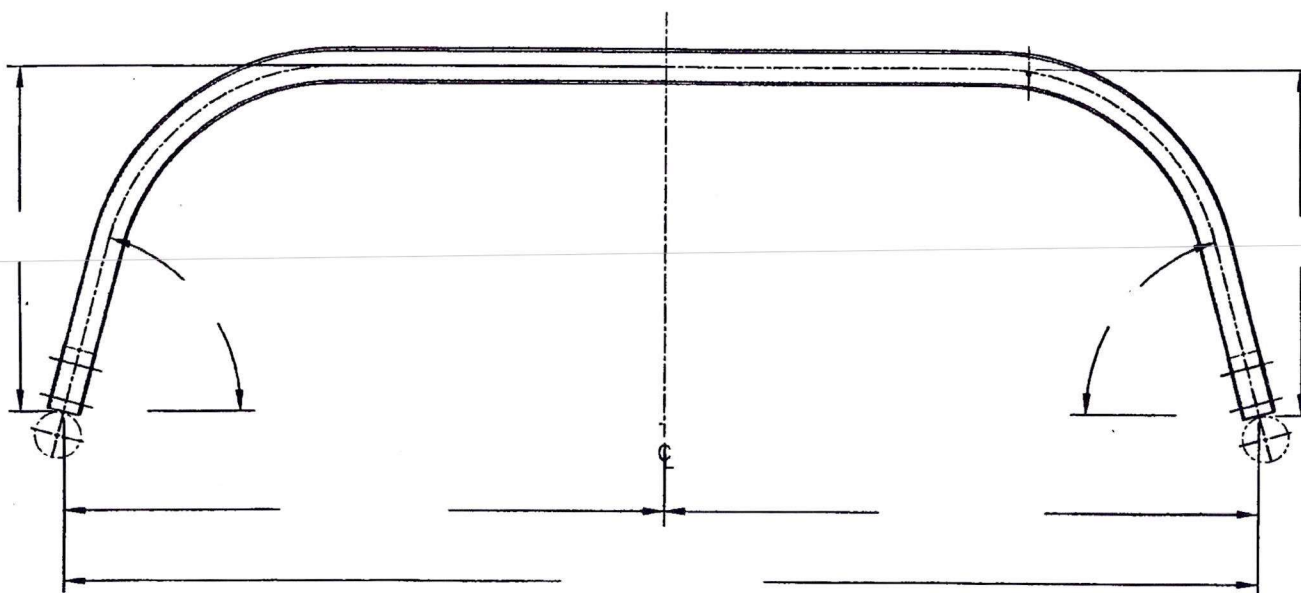


RELEASED
2018 JAN 24 *up*

DESIGN	<i>4</i>	DART AEROSPACE LTD	
DRAWN	<i>up</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>ASS</i>	DRAWING NO.	REV. C
MFG. APPR.	<i>DB</i>	D205-596-105	SHEET 3 OF 3
APPROVED	<i>WM</i>	TITLE	SCALE
DE APPR.	<i>up</i>	CROSSTUBE ASSEMBLY, HI-HI FWD	NTS
DATE	17.08.23	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

DART AEROSPACE LTD		Work Order:	
Description: Crosstube High-High Fwd		Part Number:	D205-596-105
Inspection Dwg: D205-596-105 Rev: B		Page 1 of 1	

Required Dimension	Min	Max
Height	32.4	32.6
1/2 Span	54.6	54.8
Angle	49	52
Total Span	109.2	109.6
Bending Passes	3	--
Crushing	--	6%



	Side A	Side B
Bending Passes		
Crushing		
Comments		

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	08.04.21	Dwg Rev updated	KJ/JM	
C	12.04.16	Added bending, crushing dimensions	KJ	